We Claim:

1. A method for the preparation of a recombinant polypeptide comprising
a) introducing into a host cell an expression vector comprising:
(1) a nucleic acid sequence capable of regulating transcription in a host cell, operatively linked to
(2) a chimeric nucleic acid sequence encoding a fusion protein, the chimeric nucleic acid sequence comprising (a) a nucleic acid sequence encoding a pro-peptide derived from an autocatalytically maturing zymogen, linked in reading frame to (b) a nucleic acid sequence heterologous to the pro-peptide and encoding the recombinant polypeptide; operatively linked to
(3) a nucleic acid sequence encoding a termination region functional in said host cell,
b) growing the host cell to produce said fusion protein; and
c) altering the environment of the fusion protein so that the pro-peptide is cleaved from the fusion protein to release the recombinant polypeptide.

2. A method according to claim 1 wherein said pro-peptide is derived from a protease.

3. A method according to claim 1 wherein said pro-peptide is derived from an aspartic protease, a serine protease or a cysteine protease.

4. A method according to claim 1 wherein said pro-peptide is selected from the group comprising chymosin, trypsinogen, pepsin, HIV-1 protease, pepsinogen, cathepsin or yeast proteinase A.

5. A method according to claim 1 wherein the polypeptide is hirudin or carp growth hormone.

6. The method according to claim 1 wherein the chimeric nucleic acid sequence does not include a sequence encoding a mature form of the zymogen.

7. A method according to claim 1 wherein the altering the environment comprises altering the pH, altering the salt concentration or altering the temperature.

8. A method according to claim 7 wherein the altering the pH comprises altering the pH to a pH from about 2 to about 4.5.

9. A method according to claim 1 wherein the altering the environment takes place under *in vitro* conditions.

10. A method according to claim 1 wherein said altering the environment takes place under *in vivo* conditions.

11. A method according to claim 10 wherein the *in vivo* conditions are those prevalent in a tissue or bodily fluid of an animal.

12. A method according to claim 11 wherein the tissue or bodily fluid comprises the milk, blood, the stomach, the gut or the kidneys of said animal.

13. A method according to claim 1 wherein a mature form of an autocatalytically maturing zymogen is added in step (c) wherein said zymogen is homologous to the pro-peptide.

14. A method according to claim 1 wherein a mature form of an autocatalytically maturing zymogen is added in step (c) wherein said zymogen is heterologous to the pro-peptide.

15. The method according to claims 13 or 14 wherein the mature zymogen is added under in vitro conditions.

16. The method according to claims 13 or 14 wherein the mature zymogen is added under in vivo conditions.

17. The method according to claim 16 wherein said in vivo conditions are those prevalent in a tissue or bodily fluid of an animal.

18. The method according to claim 17 wherein the tissue or bodily fluid is a stomach, kidney, gut, blood or milk of said animal.

19. A method according to any one of claims 1 to 18 wherein said nucleic acid sequences are deoxyribonucleic acid (DNA) sequences.

20. A chimeric nucleic acid sequence encoding a fusion protein comprising (a) a nucleic acid sequence encoding a pro-peptide from an autocatalytically maturing zymogen

and (b) a nucleic acid sequence encoding a polypeptide that is heterologous to the propeptide.

21. A chimeric nucleic acid sequence according to claim 20 wherein the propeptide is derived from a protease.

22. A chimeric nucleic acid sequence according to claim 20 wherein the propeptide is derived from a serine protease, aspartic protease or a cysteine protease.

23. A chimeric nucleic acid sequence according to claim 20 wherein the propeptide is derived from chymosin, trypsinogen, pepsin, HIV-1 protease, pepsinogen, cathepsin or yeast proteinase A.

24. A chimeric nucleic acid sequence according to claim 20 wherein the polypeptide is hirudin or carp growth hormone.

25. A chimeric nucleic acid sequence according to claim 20 which does not include a sequence encoding a mature form of the zymogen.

26. A chimeric nucleic acid sequence according to any one of claims 20 to 25 wherein said nucleic acid sequences are deoxyribonucleic acid (DNA) sequences.

27. A chimeric nucleic acid sequence according to claim 26 wherein the chimeric sequence is as shown in SEQ.ID.NO 1. or SEQ. ID. NO.2.

28. An expression vector comprising a chimeric nucleic acid sequence according to any one of claims 20 to 27 and a regulatory sequence suitable for expression in a host cell.

29. A transformed host cell containing an expression vector according to claim 28.

30. A transformed host cell containing an expression vector according to claim 28 wherein the host cell is a bacterial cell, a fungal cell, a plant cell or an animal cell.

31. A method of delivering a therapeutic or nutritional polypeptide to a human or animal comprising

(a) providing a fusion protein comprising

(i) a pro-peptide derived from an autocatalytically maturing enzyme, linked to

(ii) a polypeptide that is heterologous to the pro-peptide and is a therapeutic or nutritional protein; and

(b) administering the fusion protein to the human or animal where the therapeutic or nutritional polypeptide is cleaved from the pro-peptide.

32. A method according to claim 31 wherein the mature form of an autocatalytically maturing zymogen is added in step (b).

33. A method according to claim 31 wherein said mature autocatalytically maturing zymogen is homologous to the pro-peptide.

34. A method according to claim 31 wherein said mature autocatalytically maturing zymogen is heterologous to the pro-peptide.

35. A method according to any one of claims 31 to 34 wherein said pro-peptide is derived from a protease.

36. A method according to claim 35 wherein said protease is an aspartic protease, a serine protease or a cysteine protease.

37. A method according to claim 35 wherein said protease is chymosin, trypsinogen, pepsin, HIV-1 protease, pepsinogen, cathepsin or yeast proteinase A.

38. A method according to any one of claims 31 to 37 wherein the polypeptide is a vaccine, a peptide antibiotic, a cattle feed enzyme, a cytokine, a gastric lipase or a lactase.

39. A pharmaceutical composition comprising a fusion protein which comprises (a) a pro-peptide derived from an autocatalytically maturing zymogen and (b) a polypeptide that is heterologous to the pro-peptide, in admixture with a suitable diluent or carrier.

40. A food composition comprising a fusion protein which comprises a pro-peptide derived from an autocatalytically maturing zymogen and (b) a polypeptide that is heterologous to the pro-peptide, in admixture with a suitable diluent or carrier.

41. A pharmaceutical composition comprising a chimeric nucleic acid sequence encoding a fusion protein, the chimeric nucleic acid sequence comprising (a) a first nucleic acid sequence encoding a pro-peptide derived from an autocatalytically maturing zymogen and (b) a second nucleic acid sequence encoding a polypeptide that is heterologous to the pro-peptide.

42. A food composition comprising a chimeric nucleic acid sequence encoding a fusion protein, the chimeric nucleic acid sequence comprising (a) a first nucleic acid sequence encoding a pro-peptide derived from an autocatalytically maturing zymogen and (b) a second nucleic acid sequence encoding a polypeptide that is heterologous to the pro-peptide.

43. A composition according to claim 41 or 42 wherein the nucleic acid sequences are deoxyribonucleic acid (DNA) sequences.

44. A composition according to claim 41, 42 or 43 wherein said chimeric nucleic acid sequence does not include a sequence encoding a mature form of the zymogen.

45. A fusion protein comprising (a) a pro-peptide derived from an autocatalytically maturing zymogen and (b) a polypeptide that is heterologous to the pro-peptide.

46. A fusion protein according to claim 45 which does not include a mature form of the zymogen.

47. A use of a fusion protein comprising (i) a pro-peptide derived from an autocatalytically maturing enzyme, linked to (ii) a polypeptide that is heterologous to the pro-peptide and is a therapeutic or nutritional protein; to deliver a therapeutic or nutritional protein to a human or animal.